

Appendix 4

Alignment of dengue virus polyproteins

DEN4	1	MNQRKKVVRPPFNMLKRERNRVSTPQGLVKRFSTGLFSGKGPLRMVLAF	49
DEN1-WP	1	MNNQRKKKTGRPSFNMLKRARNRVSTVSQLAKRFSKGLLSGQGPMKLVMAF	50
DEN2-NGC	1	MNNQRKKARNTPFNMLKRERNRVSTVQQLTKRFSLGMLQGRGPLKLFMAL	50
DEN3-H87	1	MNNQRKKKTGKPSINMLKRVNRVSTGSQLAKRFSRGLLNGQGPMKLVMAF	50

DEN4	50	ITFLRVLSIPPTAGILKRWGQLKKNKAIKILIGFRKEIGRMLNILNGRKR	99
DEN1-WP	51	IAFLRFLAIPPTAGILARWGSFKKNGAIKVLRGFKKEISNMLNIMNRRKR	100
DEN2-NGC	51	VAFLRFLTIPPTAGILKRWGTIKSKAINVLRGFRKEIGRMLNILNRRRR	100
DEN3-H87	51	IAFLRFLAIPPTAGVLARWGTFFKSGAIKVLKGFKKEISNMLSIIINKRKK	100
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DEN4	100	STITLLCLIPTVMAFSLSTRDGEPLMIVAKHERGRPLLFKTTTEGINKCTL	149
DEN1-WP	101	SVTMLLMLLPTALAFHLTTTRGGEPMIVSKQERGKSLLFKTSAGVNMCTL	150
DEN2-NGC	101	TAGMIIMLIPTVMAFHLTTTRNGEPMIVSRQEKGKSLLFKTEDGVNMCTL	150
DEN3-H87	101	TSLCLMMMLPATLAFHLTSRDGEPRMIVGKNERGKSLLFKTASGINMCTL	150
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DEN4	150	IAMDLGEMCEDTVTYKCPLLVNTEPEDIDCWCNLTSTWVMYGTCTQSGER	199
DEN1-WP	151	IAMDLGELCEDTMTYKCPRITETEPDDVDCWCNATETWVTYGTCSQTGEH	200
DEN2-NGC	151	MAMDLGELCEDTITYKCPFLRQNEPEDIDCWCNSTSTWVTYGTCTTTGEH	200
DEN3-H87	151	IAMDLGEMCDDTVTYKCPHITEVEPEDIDCWCNLTSTWVTYGTCTNQAGEH	200
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DEN4	200	RREKRSVALTPHSGMGLETRAETWMSSEGAWKHAQRVESWILRNPFGFALL	249
DEN1-WP	201	RRDKRSVALAPHVGLGLETRTETWMSSEGAWKQIQKQVETWALRHPGFTVI	250
DEN2-NGC	201	RREKRSVALVPHVGMGLETRTETWMSSEGAWKHAQRIETWILRHPGFTIM	250
DEN3-H87	201	RRDKRSVALAPHVGMGLDTRTQTWMSAEGAWRQVEKQVETWALRHPGFTIL	250
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DEN4	250	AGFMAYMIGQTGIQRTVFFVLMMLVAPSYGMRCVGVGNRDFVEGVSGGAW	299
DEN1-WP	251	ALFLAHAIGTSITQKGIIFILLMLVTPSMAMRCVGVGNRDFVEGLSGATW	300
DEN2-NGC	251	AAILAYTIGTTHFQRALIFILLTAVAPSMTRCIGISNRDFVEGVSGGSW	300
DEN3-H87	251	ALFLAHYIGTSLTQKVIFILLMLVTPSMTRCIVGVGNRDFVEGLSGATW	300
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DEN4	300	VDLVLEHGGCVTTMAQKPTLDFELTKTTAKEVALLRTYCIEASISNITT	349
DEN1-WP	301	VDVVLEHGSCVTTMAKDKPTLDIELLKTEVTNPAVLRKLCIEAKISNTTT	350
DEN2-NGC	301	VDIVLEHGSCVTTMAKNKPTLDFELIKTEAKQPATLRKYCIEAKLTNTTT	350
DEN3-H87	301	VDVVLEHGGCVTTMAKNKPTLDIELQKTEATQLATLRKLCIEGKITNITT	350
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DEN4	350	ATRCPTQGEPYLKKEEQDQYICRRDVRGWDGNGCGLFGKGGVVTCAKFS	399
DEN1-WP	351	DSRCPTQGEATLVEEQDTNFVCRRTFVDRGWDGNGCGLFGKGLITCAKFK	400
DEN2-NGC	351	DSRCPTQGEPSLNEEQDKRFVCKHSMVDRGWDGNGCGLFGKGGIVTCAMFT	400
DEN3-H87	351	DSRCPTQGEAILPEEQDQNYVCKHTYVDRGWDGNGCGLFGKGLVTCAMFQ	400
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DEN4	400	CSGKITGNLVQIENLEYTVVVTVHNGDTHAVGNDTSNHGVTAMITPRSPS	449
DEN1-WP	401	CVTKLEGKIVQYENLKYSVIVTVHTGDQHGVGNETTEHGTTATITPQAPT	450
DEN2-NGC	401	CKKNMKGKVVQPENLEYTIVITPHSGEEHAVGNDTGKHGKEIKITPQSSI	450
DEN3-H87	401	CLESIEGKVVQHENLKYTVIITVHTGDQHGVGNET--QGVTAEITSQAST	448
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DEN4	450	VEVKLPDYGELTLDCEPRSGIDFNEMILMKMKKTWLVHKQWFLDLPLPW	499
DEN1-WP	451	SEIQLTDYGALTLDSPRTGLDFNEMVLLTMEKKSWSLVHKQWFLDLPLPW	500
DEN2-NGC	451	TEAELTGYGTVTMECSPRTGLDFNEMVLLQMENKAWLVHRQWFLDLPLPW	500
DEN3-H87	449	AEAILPEYGTGLGLECSPRTGLDFNEMILLTMKNKAWMVHRQWFFDLPLPW	498
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DEN4	500	TAGADTSEVHWNYKERMVTFKVPNAKRQDVTVLGSQEGAMHSALAGATEV	549
DEN1-WP	501	TSGASTSQETWNRQDLLVTFKTAHAKKQEVVVLGSQEGAMHTALTGATEI	550
DEN2-NGC	501	LPGADTQGSNWIQKETLVTFKNPHAKKQDVVVLGSQEGAMHTALTGATEI	550
DEN3-H87	499	TSGATTKTPTWNRKELLVTFKNAHAKKQEVVVLGSQEGAMHTALTGATEI	548
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DEN4	550	DSGDGNHMFAGHLKCKVRMEKLRIKMSYTMCSGKFSIDKEMAETQHGT	599
DEN1-WP	551	QTSGTTTIFAGHLKCRCLKMDKLTCLKGMSYVMCTGSFKLEKEVAETQHGT	600
DEN2-NGC	551	QMSSGNLLFTGHLKCRCLKMDKLTCLKGMSYSMCTGKFKVVKIEAETQHGT	600
DEN3-H87	549	QTSGGTSIFAGHLKCRCLKMDKLTCLKGMSYAMCLNTFVLKKEVSETQHGT	598
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DEN4	600	VVKVKYEGAGAPCKVPIEIRDVNKEKVVGRISSTPLAENTNSVTNIELE	649
DEN1-WP	601	LVQVKYEGTDAPCKIPFSSQDEKGVTONGRRLITANPIVTDKEKPVNIEAE	650
DEN2-NGC	601	VIRVQYEGDGSPCKIPFIMDLEKRVHLGRLITVNPVTEKDSPVNIEAE	650
DEN3-H87	599	LIKVEYKGEDAPCKIPFSTEDGQGAHNGRLITANPVVTKKEEPVNIEAE	648
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DEN4	650	PPFGDSYIVIGVGNALTLHWFRKGSSIGKMFESTYRGAKRMAILGETAW	699
DEN1-WP	651	PPFGESYIVVGAGEKALKSWFKKGSSIGKMFATARGARRMAILGDTAW	700
DEN2-NGC	651	PPFGDSYIIIGVEPGQLKLNWFKKGSSIGQMIETTMRGAKRMAILGDTAW	700
DEN3-H87	649	PPFGESNIVIGIGDKALKINWYRKGSIGKMFATARGARRMAILGDTAW	698
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DEN4	700	DFGSVGGGLFTSLGKAVHQVFGSVYTTMFGGVSWMIRILIGFLVLWIGTNS	749
DEN1-WP	701	DFGSIGGVFTSVGKLIHQIFGTAYGVLFSGVSWTMKIGIGILLTWLGLNS	750
DEN2-NGC	701	DFGSLGGVFTSIGKALHQVFGAIYGAAFSGVSWTMKILIGVIITWIGMNS	750
DEN3-H87	699	DFGSVGGVLNSLGKVMHQIFGSAYTALFSGVSWIMKIGIGVLLTWIGLNS	748
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DEN4	750	RNTSMAMTCIAVGGITLFLGFTVQADMGCVASWSGKELKCGSGIFVVDNV	799
DEN1-WP	751	RSTSLSMTCIAVGMVTLYLGVMVQADSGCVINWKGRELKCGSGIFVTNEV	800
DEN2-NGC	751	RSTSLSVSLVLVGVTLYLGVMVQADSGCVVSWKNKELKCGSGIFITDNV	800
DEN3-H87	749	KNTSMSFSCIAIGIITLYLGVVVQADMGCVINWKGKELKCGSGIFVTNEV	798
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DEN4	800	HTWTEQYKFQPESPARLASAILNAHKDGVCGIRSTTRLENVMWKQITNEL	849
DEN1-WP	801	HTWTEQYKFQADSPKRLSAAIGKAWEEGVCGIRSATRLENIMWKQISNEL	850
DEN2-NGC	801	HTWTEQYKFQPESPSKLASAIQKAHEEGICGIRSVTRLENLMWKQITPEL	850
DEN3-H87	799	HTWTEQYKFQADSPKRVTATAIAGAWENGVCIRSTTRMENLLWKQIANEL	848
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DEN4	850	NYVLWEGGHDLTVVAGDVKGVLTKGKRALTPPVSDLKYSWKTWGKAKIFT	899
DEN1-WP	851	NHILLENDMKFTVVVGDVSGILAQGGKMIRPQPMCHKYSWKSWGKAKIIG	900
DEN2-NGC	851	NHILSENEVKLTIMTGDIKGIMQAGKRSLOPQPTLKYSWKTWGKAKMLS	900
DEN3-H87	849	NYILWENDIKLTVVVGDIITGVLEQGGKRTLTTPQPMELKYSWKTWGLAKIVT	898
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DEN4	900	PEARNSTFLIDGPDITSECPNERRAWNSLEVEDYGFGMFTTNIWMKFREGS	949
DEN1-WP	901	ADVQNTTTFIDGPNITPECNDRAWNIEVEDYGFGITTTNIWLKLKRDY	950
DEN2-NGC	901	TESHNQTFIDGPDITAECPNITNRAWNSLEVEDYGFGVFTTNIWLKLREKQ	950
DEN3-H87	899	AETQNSSFIIDGPDITPECPSASRAWNVVEDYGFGVFTTNIWLKLREVE	948
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DEN4	950	SEVCDHRLMSAAIKDQKAVHADMGYWIESSKNQWQIEKASLIEVKTCW	999
DEN1-WP	951	TQVCDHRLMSAAIKDSKAVHADMGYWIESEKNETWKLARASFIEVKTCIW	1000
DEN2-NGC	951	DVFCDSKLMSAAIKDNRAVHADMGYWIESALNDTWKIEKASFIEVKSCHW	1000
DEN3-H87	949	TQLCDHRLMSAAVKDERAVHADMGYWIESQKNGSWKLEKASLIEVKTCW	998
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DEN4	1000	PKTHTLWSNGVLESQMLIPKSYAGPFSQHNYRQGYATQTVGPWHLGKLEI	1049
DEN1-WP	1001	PKSHTLWSNGVLESEMIIPKIYGGPISQHNYRPGYFTQTAGPWHLGKLEL	1050
DEN2-NGC	1001	PKSHTLWSNGVLESEMIIPKNFAGPVSQHNYRPGYHTQTAGPWHLGKLEM	1050
DEN3-H87	999	PKSHTLWSNGVLESDMIIPKSLAGPISQHNHRPGYHTQTAGPWHLGKLEL	1048
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DEN4	1050	DFGECPGTTVTIQEDCDHRGPSLRITTTASGKLVTQWCCRSCTMPPLRFLG	1099
DEN1-WP	1051	DFDLCEGTTVVVDEHCGNRGPSLRITTTVTGKTIHEWCCRSCTLPPLRFKG	1100
DEN2-NGC	1051	DFDFCEGTTVVVTEDCGNRGPSLRITTTASGKLITEWCCRSCTLPPLRYRG	1100
DEN3-H87	1049	DFNYCEGTTVVISENCGRGPSLRITTTVSGKLIHEWCCRSCTLPPLRYMG	1098
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DEN4	1100	EDGCWYGMEIRPLSEKEENMVKSQVITAGQGTSETFSMGLLCLTLFVEECL	1149
DEN1-WP	1101	EDGCWYGMEIRPVKEKEENLVKSMVSAGSGEVDSFSLGLLCISIMIEEVM	1150
DEN2-NGC	1101	EDGCWYGMEIRPLKEKEENLVNSLVITAGHGQIDNFSGLVGLMALFLEEM	1150
DEN3-H87	1099	EDGCWYGMEIRPINEKEENMVKSLSAGSGKVDNFTMGVLCALIFEEVM	1148
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DEN4	1150	RRRVTRKHMIILVVITLCAIILGGLTWMDLLRALIMLGDTMSGRIG-GQI	1198
DEN1-WP	1151	RSRWSRKMLMTGTALVFLLLTMGQLTWNDLIRLCIMVGANASDKMGMTT	1200
DEN2-NGC	1151	RTRVGTKHAILLVAVSFVTLITGNMSFRDLGRVMVMVGATMTDDIGMGVT	1200
DEN3-H87	1149	RGKFGKKHMIAGVLTFTVLLLSGQITWRGMAHTLIMIGSNASDRMGMTT	1198
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DEN4	1199	HLAIMAVFKMSPGYVLGVFLRKLTSRETALMVIGMAMTTVLSIPHDLME	1248
DEN1-WP	1201	YLALMATFRMRPMFAVGLLFRRLTSREVLLLTVGLSLVASVELPNSLEEL	1250
DEN2-NGC	1201	YLALLAAFKVRPTFAAGLLLRKLTSKELMMTTIGIVLLSQSTIPETILEL	1250
DEN3-H87	1199	YLALIATFKIQPFLALGFLLRKLTSRENLLLVGLLAMAATLRLPEDIEQM	1248
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DEN4	1249	IDGISLGLILLKIVTQFDNTQVGTALSLTFIRSTMPLVMAWRTIMAVLF	1298
DEN1-WP	1251	GDGLAMGIMMLKLLTDFQSHQLWATLLSLTFVKTTFSLHYAWKTAMILS	1300
DEN2-NGC	1251	TDALALGMMVLKMKVRKMEKYQLAVTIMAILCVPNAVILQNAWKVSCITLA	1300
DEN3-H87	1249	ANGIALGLMALKLITQFETYQLWTALVSLTCSNTIFTLTVAWRTATLILA	1298
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DEN4	2198	AASIILEFFLMVLLIPEPEKQPTPQDNQLIYVILTILTIIGLIAANEMGL	2247
DEN1-WP	2200	AASIILEFFLMVLLIPEPDRQRTPTQDNQLAYVVIGLLFMILTAAANEMGL	2249
DEN2-NGC	2199	AASIILEFFLIVLLIPEPEKQRTPTQDNQLTYVVIAILTVVAATMANEMGF	2248
DEN3-H87	2198	ASAIVLEFFMMVLLIPEPEKQRTPTQDNQLAYVVIGILTAAIVAANEMGL	2247
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DEN4	2248	IEKTKTDFGFY---QVKTETTILDVDLRPASAWTLYAVATTILTPMLRH	2293
DEN1-WP	2250	LETTKKDLGIGHAAENHHHAAMLVDLHPASAWTLYAVATTIITPMMRH	2299
DEN2-NGC	2249	LEKTKKDLGLG-SITTQQPESNILDIDLRPASAWTLYAVATTFTVTPMLRH	2297
DEN3-H87	2248	LETTKRDLGMS-KEPGVVSPTSYLVDLHPASAWTLYAVATTVITPMLRH	2296
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DEN4	2294	TIENTSANLSLAAIANQAAVLMGLGKGWPLHRMDLGVPLLAMGCYSQVNP	2343
DEN1-WP	2300	TIENTTANISLTAIANQAAILMGLDKGWPI SKMDIGVPLLAIGCYSQVNP	2349
DEN2-NGC	2298	SIENSSVNVSLTAIANQATVLMGLGKGWPLSKMDIGVPLLAIGCYSQVNP	2347
DEN3-H87	2297	TIENSTANVSLAAIANQAVVLMGLDKGWPI SKMDLGVPLLAIGCYSQVNP	2346
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DEN4	2344	TTLTASLVMLLVHYAIIIGPGLQAKATREAQKRTAAGIMKNPTVDGITVID	2393
DEN1-WP	2350	LTLTAAVFMLVAHYAIIIGPGLQAKATREAQKRTAAGIMKNPTVDGIVAID	2399
DEN2-NGC	2348	ITLTAALFLLVAHYAIIIGPGLQAKATREAQKRAAAGIMKNPTVDGITVID	2397
DEN3-H87	2347	LTLIAAVLLLVTYHYAIIIGPGLQAKATREAQKRTAAGIMKNPTVDGIMTID	2396
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DEN4	2394	LEPISYDPKFEKQLGQVMLLVLCAGQLLLMRTTWAFCEVLTLATGPILTL	2443
DEN1-WP	2400	LDPVVYDAKFEKQLGQIMLLILCTSQLLMRTTWALCESITLATGPLTTL	2449
DEN2-NGC	2398	LDPIPYDPKFEKQLGQVMLLVLCVTQVLMRTTWALCEALTATGPISTL	2447
DEN3-H87	2397	LDPVIYDSKFEKQLGQVMLLVLCVQQLLMRTSWALCEVLTLATGPITTL	2446
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DEN4	2444	WEGNPGRFWNTTIAVSTANIFRGSYLAGAGLAFSLIKNAQTPRRGTGTTG	2493
DEN1-WP	2450	WEGSPGKFWNTTIAVSMANIFRGSYLAGAGLAFSLMKS LGGRRGTGAQG	2499
DEN2-NGC	2448	WEGNPGRFWNTTIAVSMANIFRGSYLAGAGLLFSIMKNTTNTRRGTGNIG	2497
DEN3-H87	2447	WEGSPGKFWNTTIAVSMANIFRGSYLAGAGLALSIMKSVGTGKRGTGSQG	2496
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DEN4	2494	ETLGEKWKRQLNSLDRKEFEYKRS GILEVDRTEAKSALKDGS KIKHAVS	2543
DEN1-WP	2500	ETLGEKWKRQLNQLSKSEFNTYKRS GII EVDRSEAKEGLKRGEPTKHAVS	2549
DEN2-NGC	2498	ETLGEKWKSRLNALGKSEFQIYKKS GIIQEVDRTLAK EGIKRGETDHHAVS	2547
DEN3-H87	2497	ETLGEKWKKLNQLSRKEFDLYKKS GITEVDRTEAKEGLKRGEITHHAVS	2546
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DEN4	2544	RGSSKIRWIVERGMVKPKGKVVDLGCGRGGWSYYMATLKNVTEVKGYTKG	2593
DEN1-WP	2550	RGTAKLRWFVERN LVKPEGKVIDLGCGRGGWSYYCAGLKKVTEVKGYTKG	2599
DEN2-NGC	2548	RGSAKLRFVERN MVTPPEGKVVDLGCGRGGWSYYCGGLKNVREVKGLTKG	2597
DEN3-H87	2547	RGSAKLQWFVERN MVIPEGRVIDLGCGRGGWSYYCAGLKKVTEVRGYTKG	2596
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DEN4	2594	GPGHEEPIPMATYGWNLVKLHSGVDVFYKPTEQVDTLLCDIGESSNP TI	2643
DEN1-WP	2600	GPGHEEPIPMATYGWNLVKLYSGKDVFFTPPEKCDTLLCDIGESSNP TI	2649
DEN2-NGC	2598	GPGHEEPIPMSTYGWNLVRLQSGVDVFFFTPPEKCDTLLCDIGESSNP TV	2647
DEN3-H87	2597	GPGHEEPPVMSTYGWNIVKLMSGKDVFYLPPEKCDTLLCDIGESSNP TV	2646
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DEN4	2644	EEGRTLRLVKMVEPWLSSKPEFCIKVLNPMPTVIEELEKLQRKHGGNLV	2693
DEN1-WP	2650	EEGRTLRLVKMVEPWLGRN-QFCIKILNPMPSVVETLEQMQRKHGGMLV	2698
DEN2-NGC	2648	EAGRTLRLVLNLVENWLNNTQFCIKVLNPMPSVIEKMEALQRKYGGALV	2697
DEN3-H87	2647	EESRTIRVLKMVEPWLKNN-QFCIKVLNPMPTVIEHLERLQRKHGGMLV	2695
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DEN4	2694	RCPLSRNSTHEMYWVSGASGNIVSSVNTTSKMLLNRFTRHRKPTYEKDV	2743
DEN1-WP	2699	RNPLSRNSTHEMYWVSCGTGNIVSAVNMTSRMLLNRFMAHRKPTYERDV	2748
DEN2-NGC	2698	RNPLSRNSTHEMYWVSNASGNIVSSVMISRMLINRFMRHKKATYEPDV	2747
DEN3-H87	2696	RNPLSRNSTHEMYWISNGTGNIVSSVMVSRLLLNRFMTTHRRPTIEKDV	2745
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DEN4	2744	DLGAGTRSVSTETEKPDMTIIGRRLQRLQEEHKETWHYDQENPYRTWAYH	2793
DEN1-WP	2749	DLGAGTRHVAVEPEVANLDIIGQRIENIKNGHKSTWHYDEDNPYKTWAYH	2798
DEN2-NGC	2748	DLGSGTRNIGIESEIPNLDIIGKRIEKIKQEHETSWHYDQDHPYKTWAYH	2797
DEN3-H87	2746	DLGAGTRHVNAEPETPNMDVIGERIKRIKEHSSTWHYDDENPYKTWAYH	2795
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DEN4	2794	GSYEAPSTGSASSMVNGVVKLLTKPWDVIPMVTQLAMTDTTTPFGQQRVFK	2843
DEN1-WP	2799	GSYEVKPSGSASSMVNGVVRLLTTPWDVIPMVTQIAMTDTTTPFGQQRVFK	2848
DEN2-NGC	2798	GSYETKQTSASSMVNGVVRLLTTPWDVVPMTQMAMTDTTTPFGQQRVFK	2847
DEN3-H87	2796	GSYEVKATGSASSMINGVVKLLTKPWDVVPMTQMAMTDTTTPFGQQRVFK	2845
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DEN4	2844	EKVDTRTPQPKPGTRMVMTTTANWLWALLGKKKNPRLCTREEFISKVRSN	2893
DEN1-WP	2849	EKVDTRTPKAKRGTAQIMEVTARWLWGFLSRNKKPRICTREEFTRKVRSN	2898
DEN2-NGC	2848	EKVDTRTQEPKEGTKKLMKITAEWLWKELGKKKTPRMCTREEFTRKVRSN	2897
DEN3-H87	2846	EKVDTRTPRMPGTRKVMETAEWLWRTLGRNKRPRLCTREEFTKKVRTN	2895
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DEN4	2894	AAIGAVFQEEQGWSASEAVNDSRFWELVDKERALHQEGKCESCVYNNMG	2943
DEN1-WP	2899	AAIGAVFVDENQWNSAKEAVEDERFWDLVHRERELHKQKGKATCVYNNMG	2948
DEN2-NGC	2898	AALGAIFTDENKWSAREAVEDSRFWELVDKERNLHLEGKCETCVYNNMG	2947
DEN3-H87	2896	AAMGAVFTEENQWDSARAAVEDDEFWKLVDRELERLHKLKCGSCVYNNMG	2945
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DEN4	2944	KREKKLGEFGRAKGSRAIYMWLWLGARFLEFEALGFLNEDHWFGRENSWSG	2993
DEN1-WP	2949	KREKKLGEFGKAKGSRAIYMWLWLGARFLEFEALGFMNEDHWFSRENSLSG	2998
DEN2-NGC	2948	KREKKLGEFGKAKGSRAIYMWLWLGARFLEFEALGFLNEDHWFSRENSLSG	2997
DEN3-H87	2946	KREKKLGEFGKAKGSRAIYMWLGARYLEFEALGFLNEDHWFSRENSYSG	2995
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DEN4	2994	VEGEGLHRLGYILEEIDKKDGLMYADDTAGWDTRITEDDLQNEELITEQ	3043
DEN1-WP	2999	VEGEGLHKLGYILRDISKIPGGNMYADDTAGWDTRITEDDLQNEAKITDI	3048
DEN2-NGC	2998	VEGEGLHKLGYILRDVSKKEGGAMYADDTAGWDTRITLEDLKNEEMVTNH	3047
DEN3-H87	2996	VEGEGLHKLGYILRDISKIPGGAMYADDTAGWDTRITEDDLHNEEKITQQ	3045
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DEN4	3044	MAPHHKILAKAIFKLTYQNKVVVLPRPTPRGAVMDIISRKDQRGSGQVGT	3093
DEN1-WP	3049	MEPEHALLATSIFKLTYQNKVVRVQRPAKNGTVMDVISRRDQRGSGQVGT	3098
DEN2-NGC	3048	MEGEHKKLAEAIKFLTYQNKVVRVQRPTPRGTVMDIISRDRQRGSGQVGT	3097
DEN3-H87	3046	MDPEHRQLANAIFKLTYQNKVVQVRPTPKGTVMIDIISRKDQRGSGQVGT	3095
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DEN4	3094	YGLNTFTNMEVQLIRQMEAEGVITQDDMQNPKGLKERVEKWLKECGVDRL	3143
DEN1-WP	3099	YGLNTFTNMEAQLIRQMESEGIFSPSELETPN-LAERVLDWLKKHGTERL	3147
DEN2-NGC	3098	YGLNTFTNMEAQLIRQMEGEGVFKSIQHLLTVT-EEIAVQNWLARVGRERL	3146
DEN3-H87	3096	YGLNTFTNMEAQLIRQMEGEGVLSKADLENPHLEKKITQWLETKGVERL	3145
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DEN4	3144	KRMAISGDDCVVKPLDERFGTSLFLNDMGKVRKDIPQWEPSKGWKNWQE	3193
DEN1-WP	3148	KRMAISGDDCVVKPIDDRFATALNDMGKVRKDIPQWEPSKGWNDWQQ	3197
DEN2-NGC	3147	SRMAISGDDCVVKPLDDRFSALTALNDMGKVRKDIQQWEPSRGWNDWTQ	3196
DEN3-H87	3146	KRMAISGDDCVVKPIDDRFANALLALNDMGKVRKDIPQWQPSKGWHDWQQ	3195
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DEN4	3194	VPFCSHHFHKIFMKDGRSLVPCRNQDELIGRARISQGAGWSLRETACLG	3243
DEN1-WP	3198	VPFCSHHFHQLIMKDGREIVVPCRNQDELVGRARVSQGAGWSLRETACLG	3247
DEN2-NGC	3197	VPFCSHHFHELIMKDGRVLVPCRNQDELIGRARISQGAGWSLRETACLG	3246
DEN3-H87	3196	VPFCSHHFHELIMKDGRKLVPCRPQDELIGRARISQGAGWSLRETACLG	3245

DEN4	3244	KAYAQMWSLMYFHRRDLRLASMAICSAVPTWFPSTRTTWSIHAAHQWMT	3293
DEN1-WP	3248	KSYAQMWQLMYFHRRDLRLAANAICSAVPVDWVPTSRTTWSIHAAHQWMT	3297
DEN2-NGC	3247	KSYAQMWWSLMYFHRRDLRLAANAICSAVPSHWVPTSRTTWSIHAKHEWMT	3296
DEN3-H87	3246	KAYAQMWTLMYFHRRDLRLASNAICSAVPVHWVPTSRTTWSIHAAHQWMT	3295

DEN4	3294	TEDMLKVWNRVWIEDNPNMMDKTPVHSWEDIPYLGKREDLWCGSLIGLSS	3343
DEN1-WP	3298	TEDMLSVWNRVWIEENPWMEDKTHVSSWEDVPYLGKREDRWCGSLIGLTA	3347
DEN2-NGC	3297	TEDMLTVWNRVWIQENPWMEDKTPVESWEEIPYLGKREDQWCGSLIGLTS	3346
DEN3-H87	3296	TEDMLTVWNRVWIEDNPNMEDKTPVTTWEDVPYLGKREDQWCGSLIGLTS	3345

DEN4	3344	RATWAKNIHTAITQVRNLIGKEEYVDYMPVMKRYSAPESESEGLV	3387
DEN1-WP	3348	RATWATNIQVAINQVRRLIGNENYLDFTSMKRFRKNESDPEGALW	3392
DEN2-NGC	3347	RATWAKNIQTAINQVRSLIGNEEYTDYMPMSMKRFRREEEEEAGVLW	3391
DEN3-H87	3346	RATWAQNILTAIQVRSLIGNEEFLDYMPMSMKRFRKEEESEGAIW	3390

* Residue identity
. Residue similarity

[0238] While the present invention has been described in some detail for purposes of clarity and understanding, one skilled in the art will appreciate that various changes in form and detail can be made without departing from the true scope of the invention. All figures, tables, and appendices, as well as patents, applications, and publications, referred to above, are hereby incorporated by reference.